

WHAT IS CLAIMED IS:

1. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT coefficient in a macro block;

leaving as is only one "non-zero" coefficient encountered first in scanning in said DCT block detected to contain said DCT coefficient and transcoding all the other DCT coefficients to "0"; and

outputting said bitstream having a code quantity thereof reduced by said transcoding step.

2. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT coefficient in an inter-macro block accompanied by predictive coding;

leaving as is only a DC coefficient in said DCT block detected to contain said DCT coefficient in said inter-macro block and transcoding all the other AC coefficients to "0"; and

outputting said bitstream having a code quantity thereof reduced by said transcoding step.

3. The bitstream transcoding method according to Claim 2, wherein if said DC coefficient is "0", a predetermined AC coefficient is assigned as said coefficient to be left as is.

4. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT

coefficient in an intra-macro block not accompanied by predictive coding;

leaving as is only a DC coefficient in said DCT block detected to contain said DCT coefficient in said intra-macro block and transcoding all the other AC coefficients to "0"; and outputting said bitstream having a code quality thereof reduced by said transcoding step.

5. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT coefficient in a macro block;

leaving as are only the first through N'th coefficients (N: natural number) in said DCT block detected to contain said DCT coefficient and transcoding all the other DCT coefficients to "0"; and

outputting said bitstream having a code quantity thereof reduced by said transcoding step.

6. The bitstream transcoding method according to Claim 5, wherein when said first through N'th coefficients encountered in said scanning are all "0", a predetermined AC coefficient is assigned as said coefficient to be left as is.

7. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a macro block type indicates "performing of motion compensation and containing of a block having a DCT coefficient";

transcoding all DCT coefficients in a macro block concerned in said detection to "0" and transcoding said macro block type to such a type that indicates "performing of motion

compensation and having no DCT coefficient"; and  
outputting said bitstream having a code quantity  
thereof reduced by said transcoding step.

5           8. A bitstream transcoding method comprising the steps  
of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a macro block type indicates  
"performing of motion compensation, containing of a block  
10 having a DCT coefficient, and being a variation point in a  
quantization step";

transcoding all DCT coefficients in a macro block  
concerned in said detection to "0" and transcoding said macro  
block type to such a type that indicates "performing of motion  
15 compensation and having no DCT coefficient"; and

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step.

20           9. A bitstream transcoding method comprising the steps  
of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a relevant DCT block contains a DCT  
coefficient of a chrominance signal in a macro block;

transcoding all DCT coefficients in said DCT block of  
25 said chrominance signal concerned in said detection to "0" and  
changing a coded block pattern correspondingly; and

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step.

30           10. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a relevant DCT block contains a DCT  
coefficient of a chrominance signal in a macro block;

leaving as is only one "non-zero" coefficient  
encountered first in scanning in said DCT block containing said  
DCT coefficient of said luminance signal in a macro block  
corresponding to said DCT block of said chrominance signal  
concerned in said detection and transcoding all the other DCT  
coefficients to "0";

transcoding all DCT coefficients in said DCT block of  
said chrominance signal concerned in said detection to "0" and  
changing a coded block pattern correspondingly; and

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step.

11. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a relevant DCT block contains a DCT  
coefficient in a macro block;

leaving as is only one "non-zero" coefficient  
encountered first in scanning in said DCT block detected to  
contain said DCT coefficient and transcoding all the other DCT  
coefficients to "0";

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to  
be input with a dummy picture; and

outputting said bitstream having a code quantity  
reduced by said replacing step,

wherein the above-mentioned plurality of bitstream  
transcoding methods having different aspects is switched  
appropriately in configuration.

12. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input

to thereby detect whether a relevant DCT block contains a DCT coefficient in an inter-macro block accompanied by predictive coding;

leaving as is only a DC coefficient in said DCT block detected to contain said DCT coefficient in said inter-macro block and transcoding all the other AC coefficients to "0";

outputting said bitstream having a code quantity thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to be input with a dummy picture; and

outputting said bitstream having a code quantity reduced by said replacing step,

wherein the above-mentioned plurality of bitstream transcoding methods having different aspects is switched appropriately in configuration.

13. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT coefficient in an intra-macro block not accompanied by predictive coding;

leaving as is only a DC coefficient in said DCT block detected to contain said DCT coefficient in said intra-macro block and transcoding all the other AC coefficients to "0";

outputting said bitstream having a code quality thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to be input with a dummy picture; and

outputting said bitstream having a code quantity reduced by said replacing step,

wherein the above-mentioned plurality of bitstream transcoding methods having different aspects is switched appropriately in configuration.

14. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a relevant DCT block contains a DCT coefficient in a macro block;

leaving as are only the first through N'th coefficients (N: natural number) in said DCT block detected to contain said DCT coefficient and transcoding all the other DCT coefficients to "0";

outputting said bitstream having a code quantity thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to be input with a dummy picture; and

outputting said bitstream having a code quantity reduced by said replacing step,

wherein the above-mentioned plurality of bitstream transcoding methods having different aspects is switched appropriately in configuration.

15. A bitstream transcoding method comprising the steps of:

analyzing a data structure of a bitstream to be input to thereby detect whether a macro block type indicates "performing of motion compensation and containing of a block having a DCT coefficient";

transcoding all DCT coefficients in a macro block concerned in said detection to "0" and transcoding said macro block type to such a type that indicates "performing of motion compensation and having no DCT coefficient";

outputting said bitstream having a code quantity thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to be input with a dummy picture; and

outputting said bitstream having a code quantity  
reduced by said replacing step,

wherein the above-mentioned plurality of bitstream  
transcoding methods having different aspects is switched  
appropriately in configuration.

16. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a macro block type indicates  
"performing of motion compensation, containing of a block  
having a DCT coefficient, and being a variation point in a  
quantization step";

transcoding all DCT coefficients in a macro block  
concerned in said detection to "0" and transcoding said macro  
block type to such a type that indicates "performing of motion  
compensation and having no DCT coefficient";

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to  
be input with a dummy picture; and

outputting said bitstream having a code quantity  
reduced by said replacing step,

wherein the above-mentioned plurality of bitstream  
transcoding methods having different aspects is switched  
appropriately in configuration.

17. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input  
to thereby detect whether a relevant DCT block contains a DCT  
coefficient of a chrominance signal in a macro block;

transcoding all DCT coefficients in said DCT block of  
said chrominance signal concerned in said detection to "0" and

changing a coded block pattern correspondingly;  
outputting said bitstream having a code quantity  
thereof reduced by said transcoding step;  
replacing an individual picture in said bitstream to  
5 be input with a dummy picture; and  
outputting said bitstream having a code quantity  
reduced by said replacing step,  
wherein the above-mentioned plurality of bitstream  
transcoding methods having different aspects is switched  
10 appropriately in configuration.

18. A bitstream transcoding method comprising the  
steps of:

analyzing a data structure of a bitstream to be input  
15 to thereby detect whether a relevant DCT block contains a DCT  
coefficient of a chrominance signal in a macro block;

leaving as is only one "non-zero" coefficient  
encountered first in scanning in said DCT block containing said  
DCT coefficient of said luminance signal in a macro block  
20 corresponding to said DCT block of said chrominance signal  
concerned in said detection and transcoding all the other DCT  
coefficients to "0";

transcoding all DCT coefficients in said DCT block of  
said chrominance signal concerned in said detection to "0" and  
25 changing a coded block pattern correspondingly;

outputting said bitstream having a code quantity  
thereof reduced by said transcoding step;

replacing an individual picture in said bitstream to  
be input with a dummy picture; and

30 outputting said bitstream having a code quantity  
reduced by said replacing step,

wherein the above-mentioned plurality of bitstream  
transcoding methods having different aspects is switched  
appropriately in configuration.



19. The bitstream transcoding method according to Claim 11, wherein, in said step of switching the plurality of bitstream transcoding methods having different aspects, said plurality of bitstream transcoding methods is switched each time a picture not employing predictive coding is input.

20. The bitstream transcoding method according to Claim 11, wherein, in said step of switching the plurality of bitstream transcoding methods having different aspects, said plurality of bitstream transcoding methods is switched each time a GOP header is input.

21. The bitstream transcoding method according to Claim 11, wherein, in said step of switching the plurality of bitstream transcoding methods having different aspects, said plurality of bitstream transcoding methods is switched each time a picture not employing predictive coding is input and each time a GOP header is input.

22. A bitstream transcoding method comprising the steps of:

setting at level 1 such a case that performs the transcoding method according to Claim 1 on a picture employing bilateral prediction;

setting at level 2 such a case that performs a transcoding method of replacing a picture employing bilateral prediction with a dummy picture;

setting at level 3 such a case that performs the transcoding method according to Claim 1 on a picture employing forward prediction;

setting at level 4 such a case that performs a transcoding method of replacing a picture employing forward prediction with a dummy picture;

setting at level 5 such a case that performs a  
transcoding method of replacing a picture not employing  
predictive coding with a dummy picture at a predetermined rate;  
detecting an instruction for switching said plurality  
of levels 1 through 5; and  
switching said levels each time said switching  
instruction is received.

23. A bitstream transcoding method comprising the  
steps of:

setting at level 1 such a case that performs the  
transcoding method according to Claim 5 on a picture employing  
bilateral prediction;

setting at level 2 such a case that performs a  
transcoding method of replacing a picture employing bilateral  
prediction with a dummy picture;

setting at level 3 such a case that performs the  
transcoding method according to Claim 5 on a picture employing  
forward prediction;

setting at level 4 such a case that performs a  
transcoding method of replacing a picture employing forward  
prediction with a dummy picture;

setting at level 5 such a case that performs a  
transcoding method of replacing a picture not employing  
predictive coding with a dummy picture at a predetermined rate;

detecting an instruction for switching said plurality  
of levels 1 through 5; and

switching said levels each time said switching  
instruction is received.

24. A bitstream transcoding method comprising the  
steps of:

setting at level 1 such a case that performs the  
transcoding method according to Claim 7 on a picture employing

bilateral prediction;

setting at level 2 such a case that performs a transcoding method of replacing a picture employing bilateral prediction with a dummy picture;

5 setting at level 3 such a case that performs the transcoding method according to Claim 7 on a picture employing forward prediction;

10 setting at level 4 such a case that performs a transcoding method of replacing a picture employing forward prediction with a dummy picture;

setting at level 5 such a case that performs a transcoding method of replacing a picture not employing predictive coding with a dummy picture at a predetermined rate;

15 detecting an instruction for switching said plurality of levels 1 through 5; and

switching said levels each time said switching instruction is received.

25. A bitstream transcoding method comprising the steps of:

setting at level 1 such a case that performs the transcoding method according to Claim 8 on a picture employing bilateral prediction;

25 setting at level 2 such a case that performs a transcoding method of replacing a picture employing bilateral prediction with a dummy picture;

setting at level 3 such a case that performs the transcoding method according to Claim 8 on a picture employing forward prediction;

30 setting at level 4 such a case that performs a transcoding method of replacing a picture employing forward prediction with a dummy picture;

setting at level 5 such a case that performs a transcoding method of replacing a picture not employing

predictive coding with a dummy picture at a predetermined rate;  
detecting an instruction for switching said plurality  
of levels 1 through 5; and  
switching said levels each time said switching  
instruction is received.

26. A bitstream transcoding method comprising the  
steps of:

setting at level 1 such a case that performs the  
transcoding method according to Claim 9 on a picture employing  
bilateral prediction;

setting at level 2 such a case that performs a  
transcoding method of replacing a picture employing bilateral  
prediction with a dummy picture;

setting at level 3 such a case that performs the  
transcoding method according to Claim 9 on a picture employing  
forward prediction;

setting at level 4 such a case that performs a  
transcoding method of replacing a picture employing forward  
prediction with a dummy picture;

setting at level 5 such a case that performs a  
transcoding method of replacing a picture not employing  
predictive coding with a dummy picture at a predetermined rate;

detecting an instruction for switching said plurality  
of levels 1 through 5; and  
switching said levels each time said switching  
instruction is received.

27. A bitstream transcoding method comprising the  
steps of:

setting at level 1 such a case that performs the  
transcoding method according to Claim 10 on a picture employing  
bilateral prediction;

setting at level 2 such a case that performs a

transcoding method of replacing a picture employing bilateral prediction with a dummy picture;

setting at level 3 such a case that performs the transcoding method according to Claim 10 on a picture employing forward prediction;

setting at level 4 such a case that performs a transcoding method of replacing a picture employing forward prediction with a dummy picture;

setting at level 5 such a case that performs a transcoding method of replacing a picture not employing predictive coding with a dummy picture at a predetermined rate;

detecting an instruction for switching said plurality of levels 1 through 5; and

switching said levels each time said switching instruction is received.

28. The bitstream transcoding method according to Claim 22, wherein said step of switching said levels is performed each time a picture not employing predictive coding is input.

29. The bitstream transcoding method according to Claim 22, wherein said step of switching said levels is performed each time a GOP header is input.

30. The bitstream transcoding method according to Claim 22, wherein said step of switching said levels is performed each predetermined time interval.

31. The bitstream transcoding method according to Claim 22, wherein at least any one of said plurality of levels is left as is to thereby remove any desired one or an any desired plurality of said levels remaining.

32. The bitstream transcoding method according to Claim 1, wherein a subject bitstream contains an image signal coded according to the MPEG standard.

33. A bitstream transcoding apparatus comprising:  
code detecting means for analyzing a data structure of an input bitstream; and

DCT coefficients reducing means for leaving as is at least one "non-zero" DCT coefficient of DCT coefficients in a DCT block of said input bitstream and transcoding all the other DCT coefficients to "0" based on a data structure analyzing result by said code detecting means.

34. A bitstream transcoding apparatus comprising:  
code detecting means for analyzing a data structure of an input bitstream;

DCT coefficients reducing means for leaving as is at least one "non-zero" DCT coefficient of DCT coefficients in a DCT block of said input bitstream and transcoding all the other DCT coefficients to "0" based on a data structure analyzing result by said code detecting means; and

macro block type transcoding method for transcoding a macro block type of said input bitstream to such a macro block type that corresponds to a processing result by said DCT coefficients reducing means based on said data structure analyzing result by said code detecting means.

35. A bitstream transcoding apparatus comprising:  
code detecting means for analyzing a data structure of an input bitstream;

DCT coefficients reducing means for leaving as is at least one "non-zero" DCT coefficient of DCT coefficients in a DCT block of said input bitstream and transcoding all the other DCT coefficients to "0" based on a data structure analyzing

result by said code detecting means; and

coded block pattern transcoding method for transcoding

a coded block pattern of said input bitstream to such a coded block pattern that corresponds to a processing result by said

DCT coefficients reducing means based on said data structure analyzing result by said code detecting means.

36. A computer-readable recording medium for use in bitstream transcode recording a program for executing:

a procedure for analyzing a data structure of an input bitstream; and

a procedure for leaving as is at least one "non-zero" DCT coefficient of DCT coefficients in a DCT block of said input bitstream and transcoding all the other DCT coefficients to "0" based on said data structure analyzing result by said data structure analyzing procedure;

37. A computer-readable recording medium for use in bitstream transcode recording a program for executing:

a procedure for analyzing a data structure of an input bitstream;

a procedure for leaving as is at least one "non-zero" DCT coefficient of DCT coefficients in a DCT block of said input bitstream and transcoding all the other DCT coefficients to "0" based on said data structure analyzing result by said data structure analyzing procedure; and

a procedure for transcoding a macro block type of said input bitstream to such a macro block type that corresponds to a processing result by said DCT coefficient transcoding procedure based on said data structure analyzing result.

38. A computer-readable recording medium for use in bitstream transcode recording a program for executing:

a procedure for analyzing a data structure of an input

bitstream;

a procedure for leaving as is at least one "non-zero"

DCT coefficient of DCT coefficients in a DCT block of said input  
bitstream and transcoding all the other DCT coefficients to "0"

5 based on said data structure analyzing result by said data  
structure analyzing procedure; and

a procedure for transcoding a coded block pattern of  
said input bitstream to such a coded block pattern that  
corresponds to a processing result by said DCT coefficient  
10 transcoding procedure based on said data structure analyzing  
result.

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